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Atty. Docket No. INK-006
(2108/13)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Albert *et al.*

SERIAL NUMBER: 09/140,862

ART UNIT: 2778

FILING DATE: August 27, 1998

EXAMINER: David L. Lewis

TITLE: Color Electrophoretic Displays

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REPLY AFTER FINAL REJECTION

Sir:

In response to the Office Action mailed May 23, 2000, for which the shortened statutory period of response is set to expire on August 23, 2000, Applicants respectfully request reconsideration of the rejection of claims 1-10. A Notice of Appeal is being submitted with this Reply.

REMARKS

Claims 1-10 are pending in the Application, and claims 1, 6 and 10 are independent claims. Claim 6 is rejected under 35 U.S.C. § 102(a) as anticipated by U.S. Patent No. 5,650,872 to Saxe *et al.* ("Saxe"), claims 1-9 are rejected under 35 U.S.C. § 102(a) as anticipated by U.S. Patent No. 3,756,693 to Ota ("Ota"), claims 1-5 and 7-10 are rejected under 35 U.S.C. § 103(a) as obvious in view of Saxe, and claim 10 is rejected under 35 U.S.C. § 103(a) as obvious in view of Ota.

The Applicants have carefully considered the Examiner's Final Office Action, and respectfully request reconsideration of the rejection of claims 1-10 for the reasons discussed below.

Applicants respectfully disagree with the Final Office Action's conclusory response to Applicants' arguments. The Final Office Action states:

Applicant's arguments with respect to claim 1-10 have been considered but are not persuasive. 1) Saxe discloses particles that orient and in that process inherently migrate. 2) As well known in the art and also well known in the art, [sic] particles can be encapsulated between two electrodes, DiSanto et al. (5279511) column 1 lines 40-45. 3) Said overlays as taught by Ota inherently color the electrodes.

(Final Office Action at page 6). These responses either miscomprehend the plain meaning of terms as used in the application or fail to consider the difference between distinct structures recited in the claims. Specifically: (1) the plain meaning of the terms "orient" and "migrate," as used by those of ordinary skill in the art and the application, is not such that a particle which orients inherently migrates; (2) enclosing particles between two electrodes does not constitute encapsulation of particles as that term is used in the application; and (3) an overlay by its very nature does not impart color to an underlying structure but rather only makes it appear colored. In addition, the Final Office Action does not respond to Applicants' arguments, but rather simply reiterates, almost verbatim, arguments of prior actions.

As Applicants have previously discussed in prior responses, the electrophoretic display of Applicants' invention changes its visual state in response to an applied electrical field because of the electrophoretic mobilities of the particles. The change of visual state via electrophoretic mobility is distinctly different from a change via the reorientation of particles to aligned them as taught by Saxe. (See, e.g., Saxe, col. 4, lines, 8-21, Figs. 3 and 4, item 21). Specifically, Applicants' independent claim 1 recites:

An electrophoretic display comprising:

at least one capsule containing a suspending fluid and at least a first particle and a second particle, said first particle having a first optical property and a first electrophoretic mobility and said second particle having a second optical property and a second electrophoretic mobility; and

at least two electrodes disposed adjacent said capsule;

wherein application of an electric field to said capsule by said electrodes causes said capsule to change visual state responsive to the optical properties and electrophoretic mobilities of said particles.

(emphasis added). As used in the application, and understood by those of ordinary skill in the art, the term "electrophoretic mobility" refers to the average velocity per unit electric field of a particle towards a positive or negative electrode. Accordingly, the visual state of the displays of the present invention change owing to migration of a particle(s) in response to an electric field. Accordingly, independent claims 6 and 10 likewise require a particle(s) to migrate to change the visual state of a display. Claim 6 recites:

6. An electrophoretic display comprising:
a substrate;
at least one capsule containing a suspending fluid and at least one particle;
at least two electrodes disposed adjacent the at least one capsule, said at least two electrodes disposed between said substrate and said at least one capsule, wherein application of a voltage potential to one of said at least two electrodes causes said at least one particle to migrate within said capsule, causing said capsule to change its visual state. [emphasis added];

and, in relevant part, claim 10 recites:

10. An electrophoretic display comprising:
at least one capsule containing a suspending fluid and at least one particle;...
wherein application of a voltage potential to said ...electrode[s] causes said white particles to migrate within the capsule to locations adjacent said...electrode[s] causing said capsule to appear white, and wherein application of a second voltage potential to said ...electrode[s] causes said white particles to migrate within said capsule to a location adjacent said white electrode causing said capsule to appear substantially black.

(emphasis added).

Applicants have previously pointed out that Saxe discloses anisometric particles located within droplets contained in a stationary position within a rigid polymeric film that respond to an electric field -not by migration- but by reorientation to become aligned. (*see, e.g.*, Saxe, col. 1, lines 15-50, col. 2, lines 55-67, col. 3, lines 57-59, col. 4, lines 8-26, and Figs. 3 and 4, item 21). This teaching of Saxe is distinctly different from that of the application because "reorientation"

does not encompass "migration" as the terms are used in the application, Saxe, and/or understood by those of ordinary skill in the art. Accordingly, Saxe does not anticipate nor render obvious Applicants' claimed inventions because Saxe does not disclose, teach or suggest the element of particle migration or that electrophoretic mobility is even a relevant property of Saxe's particles. Nevertheless, the Final Office Action's response to Applicants' priors arguments is to assert, without support, that: "Saxe discloses particles that orient and in that process inherently migrate." (Final Office Action at page 6).

Particle orientation and/or alignment does not constitute nor inherently involve particle migration. Migration necessarily involves a translational motion as the term "migrate" is used in the application whereas orientation and/or alignment does not. For example, *Webster's Ninth New Collegiate Dictionary* defines "orient" as, "3: to cause the axes of the molecules of to assume the same direction" See *Webster's Ninth New Collegiate Dictionary* (1984). This definition of "orient" is perfectly consistent with the understanding of the term by those of ordinary skill in the art and Saxe. As a result, a particle can "orient," or align," simply through rotational motion -no translational motion is required, inherent or implied. In contrast, the term "migrate" as used in the application and the art requires translational motion, i.e., motion from one location to another -not just simple rotation. Accordingly, the Final Office Action's statement that, "particles that orient and in that process inherently migrate" is facially incorrect.

Applicants have previously argued that Saxe does not teach particle migration. That Saxe does not teach particle migration is further revealed in Saxe at column 13, lines 40-44,

It should be noted that a light valve suspension can comprise more than one type of particle. Thus two or more different pigments or other types of particles may be combined in any useful proportions to form suspensions having a vast number of different off-state colors.

(See Saxe, col. 13, lines 40-44). The plain meaning of this passage indicates that Saxe is discussing only particles that align in response to an electric field -not particles which migrate- because in an electrophoretic system one cannot simply mix two pigments to achieve a mixture of the relevant colors as Saxe suggests. Rather, in an electrophoretic system electrophoretic

mobility will determine which species of pigment particle is seen and hence the color of the display.

As Applicants have previously discussed in prior responses, the electrophoretic display of Applicants' claimed invention comprises at least one capsule containing at least one species of particles and at least two electrodes disposed adjacent said capsule. The very structural relationship set forth in the specification and claims of the application make it abundantly clear that a capsule is a structure and claim element distinct from the electrodes. Specifically, in relevant part, independent claims 1, 6 and 10 all recite this limitation:

1. An electrophoretic display comprising:
at least one capsule containing a suspending ..; and
at least two electrodes disposed adjacent said capsule;
6. An electrophoretic display comprising:
a substrate;
at least one capsule containing a suspending fluid and at least one particle;
at least two electrodes disposed adjacent the at least one capsule, said at
least two electrodes disposed between said substrate and said at least one capsule,
10. An electrophoretic display comprising:
at least one capsule containing a suspending fluid and at least one particle;
a cyan-colored electrode disposed adjacent said capsule;
a magenta-colored electrode disposed adjacent said capsule, ...;
a yellow-colored electrode disposed adjacent said capsule,...; and
a white electrode adjacent said capsule,...

(emphasis added).

Applicants have previously pointed out that Ota does not disclose a capsule, but rather unencapsulated particles disposed between electrodes. (*See, e.g.*, Ota, col. 2, lines 21–41, *see also* Figs. 1a, 2-6). Accordingly, Ota does not disclose a “capsule” that is separate and distinct from the electrodes because in Ota the electrodes themselves are the walls that enclose the electrophoretic material. As a result, Ota does not disclose “electrodes disposed adjacent [the] capsule” as independent claims 1, 6 and 10 of the present invention require. Therefore, Ota does not anticipate either claim 1, 6 or 10, or the claims which depend therefrom. Nevertheless, the Final Office Action maintains the rejection of claims 1-9 under 35 U.S.C. § 102(a) based on Ota; responding to Applicants' arguments with the statement: “2) As well known in the art and also

well known in the art, [sic] particles can be encapsulated between two electrodes, DiSanto et al. (5279511) column 1 lines 40-45.” (Final Office Action at page 6). This statement neither addresses Applicants’ arguments nor establishes that Ota discloses all elements of the claimed invention as required for a rejection under 35 U.S.C. § 102(a).

Enclosing particles between two electrodes does not constitute encapsulation of particles as that term is used in the application. Applicants’ claims recite that the particle(s) are contained in a capsule(s). The Final Office Action’s statement that, “[a]s well known in the art, particles can be encapsulated between two electrodes” does not address the fact that Applicants’ claims recite two distinct physical structures: a capsule structure and an electrode structure. Simply using the term “encapsulated” as a verb in the phrase “particles can be encapsulated between two electrodes” is not responsive to the fact that Applicants’ claims recite a particle(s) contained in a “capsule” because the term “capsule” is used as a noun to describe a structural element distinct from the electrodes and not the action of encapsulation. In other words, to maintain that “encapsulating particles between two electrodes” anticipates or renders obvious Applicants’ invention would require one to read the requirement of a “capsule” out of the claims. Such a reading of Applicants’ claims is impermissible and clearly erroneous.

Further, the Final Office Action does not respond to Applicants’ arguments, but rather simply reiterates, almost verbatim, arguments of prior actions. Applicants’ have previously argued (and supported with specific cites to and quotations of Ota) that Ota does not disclose, teach or suggest a capsule separate from the electrodes, as claims 1, 6 and 10 require and that Ota actually teaches away from colored electrodes. The Final Office Action has not provided any reasoned statement or argument to counter Applicants’ arguments. The Final Office Action does not address the fact that Applicants claims 1, 6 and 10 all recite an electrode structure distinct from a capsule structure. Rather, the Final Office Action inexplicably assumes that two electrodes are the same as the two electrode plus capsule structure of Applicants’ claims.

As Applicants have previously discussed in prior responses, the electrophoretic display of Applicants’ independent claim comprises “colored electrodes” not simply electrodes that appear colored because they are viewed through a color overlay. In fact Applicants’ claim 10 makes

clear that the extra element represented by an overlay is not what imparts color to an electrode, but rather the electrodes themselves are colored:

10. An electrophoretic display comprising:...
 - a cyan-colored electrode disposed adjacent said capsule;
 - a magenta-colored electrode disposed adjacent said capsule, said magenta-colored electrode spaced apart from said cyan-colored electrode;
 - a yellow-colored electrode disposed adjacent said capsule, said yellow-colored electrode spaced apart from said cyan-colored electrode and said magenta-colored electrode; and
 - a white electrode adjacent said capsule, said white electrode spaced apart from said cyan-colored electrode, said yellow-colored electrode, and said magenta-colored electrode,wherein...

(emphasis added).

Applicants have previously pointed out that Ota does not disclose, teach, or suggest use of colored electrodes or the use of a plurality of electrodes of differing colors as set forth in claim 10 of the present invention. Rather, Ota discloses only color overlays, not colored electrodes. (See, e.g., Ota Figs. 1a and 1b, item 50). In addition, Applicants have previously pointed out that Ota teaches away from colored electrodes, and that the overlays are not electrodes, when he explicitly teaches that:

At any rate, any pattern can be displayed by providing a colored layer 50 of a desired pattern at the electrode 8 without using an electrode of a desired pattern.

(Ota, col. 3, lines 8-11)(emphasis added);

Electrical resistance of the colored layer 50 is important when [it] is interposed between the transparent electrode and the suspension layer...so that the electric field applied between the electrodes is imposed mainly across the suspension layer.

(Ota, col. 7, lines 35-47); and "The colored layer 50...may be electrically insulating." (Ota, col. 7, lines 47-49). Accordingly, Ota does not disclose, teach, or suggest colored electrodes or provide any motivation to one of ordinary skill in the art to seek a colored electrode instead of the overlays taught by Ota. As a result, the rejection of claim 10 under 35 U.S.C. § 103(a) in view of Ota is impermissible and without basis. Nevertheless the Final Office Action maintains this rejection of claim 10 even though neither the Final Office Action nor any previous office

action has shown how it is obvious to color an electrode as in Applicants' invention or that Ota provides any motivation to do so.

The Final Office Action does not address Ota's teaching away from colored electrodes at least at column 3, lines 8-11 and column 7, lines 35-49. Rather, the Final Office Action simply asserts that "overlays as taught by Ota inherently color the electrodes." This assertion, however, is contrary to the plain meaning of its own terms and the meaning of the term "colored electrode" as used in the application. The "colored electrode" of the application is itself colored. The overlay of Ota does not "color" the underlying electrode because the color of the electrode is the same after the overlay is removed as it was before. Accordingly, the overlays of Ota do not provide "colored electrodes" as that term is used in the application because they do not change the color of the electrode itself.

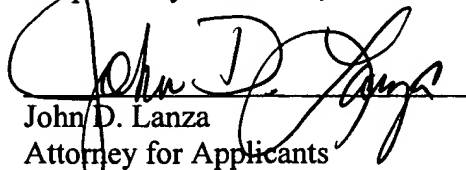
SUMMARY

Applicants request that the Examiner reconsider the application and claims in light of the foregoing Reply, and respectfully submit that the claims are in condition for allowance. If, in the Examiner's opinion, a telephonic interview would expedite the favorable prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues, and to work with the Examiner toward placing the application in condition for allowance.

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Respectfully submitted,


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